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Outcome of Surgical Resection for Chest Wall Recurrence in Breast Cancer Patients

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Background: Although recurrent breast cancer is a systemic disease, there might be several exceptions where local treatment has a favorable outcome.

Methods: From 1989 to 1996, 15 patients underwent full thickness chest wall resection, supported by peri- and postoperative systemic treatments for patients with isolated chest wall recurrences, including soft tissue local recurrence and parasternal lymph node metastasis.

Results: The 5-year survival rate after surgical removal was 47%. Patients with >5-year disease-free intervals (DFI) after mastectomy showed a long survival after chest wall resection. Local failures appeared in four cases whose surgical margins were positive. No serious complication except one pyothorax occurred after surgery.

Conclusions: It is suggested that surgical treatment with a full thickness chest wall resection might have a favorable prognosis for selected patients with solitary lesion and long DFI. J. Surg. Oncol. 64:23–26

KEY WORDS: recurrence; chest wall resection; breast cancer; myocutaneous flap

INTRODUCTION

Breast cancer consists of heterogenous subpopulations with different growth rate and diverse metastatic potential. A variety of therapeutic approaches have been used for primary and recurrent breast cancer patients [1]. Surgical approaches for the relapsed patients is uncommon because recurrent breast cancer is viewed as a systemic disease. However, isolated local relapses, such as local chest wall recurrences and solitary regional lymph node recurrences were regarded as indications for surgical treatment [2–11]. We studied the outcome of chest wall resection supported by peri- and postoperative systemic treatment in patients with isolated local relapses.

MATERIALS AND METHODS

Patients

During 1975–1995, 2,026 patients underwent mastectomy for primary breast cancer at the Tokyo Metropolitan Komagome Hospital. Recurrence at any site appeared in 433 cases (21.4%), and solitary chest wall recurrence was seen in 38 cases (1.9%). Solitary parasternal lymph node recurrence resulting in a macroscopic solid tumor was seen in four cases (0.2%). From 1989–1996, full-thickness chest wall resection was performed in 15 patients with solitary local chest wall recurrences or parasternal lymph node recurrences. The absence or presence of distant metastasis was examined by physical examination, blood chemistry, chest X-ray, bone scintigraphy, bone survey X-ray, and liver ultrasonography.

Table I shows the background characteristics of the patients. Average age was 51 years (range: 30–62 years). Fifteen tumors included nine local recurrences without distant metastasis, three parasternal lymph node metastases without distant metastasis, and three parasternal

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TABLE I. Chest Wall Recurrence in Breast Cancer Patients Treated by Chest Wall Resection

		Primary tumor		Recurrent tumor			
Case no.	Age	T[a]	n[b]	Site	Size (cm)	DFI[c]	Other lesion
1	42	3	+	local	5.5	6	-
2	59	1	−	local	4.9	72	-
3	58	2	−	local	2.5	178	-
4	62	2	−	local	2.0	150	-
5	41	2	+	local	4.0	37	-
6	48	2	+	local	2.5	42	-
7	59	2	+	PS LN[d]	3.8	58	-
8	40	1	+	PS LN[d,e]	7.8	86	bone
9	46	2	+	local	4.0	37	-
10	30	2	+	PS LN[d,e]	5.0	19	-
11	62	2	−	PS LN[d,e]	4.2	52	SC LN[f,g]
12	52	2	−	local	3.6	27	-
13	59	2	+	PS LN[d]	4.2	57	-
14	47	4	+	local	7.2	-	-
15	53	1	+	PS LN[d]	4.8	36	(brain)[h]

[a]T.
[b]Nodal status.
[c]Disease-free interval in months.
[d]Parasternal lymph node.
[e]Primary tumor was treated in other institutions.
[f]Supraclavicular lymph node.
[g]Dissected at the same time.
[h]Removed 3 years before chest wall resection.

lymph node metastases with other sites of metastasis. In patient 8, bone metastasis was detected after the surgery. For patient 11, supraclavicular lymph node dissection as well as chest wall resection were performed. Patient 15 had a history of a solitary brain metastasis, which had been removed by surgery 3 years before the chest wall resection. Disease-free interval (DFI) ranged from 6–178 months. The median follow-up period was 31 months.

Treatments

Systemic treatments were performed as described in Table II. In the recent cases, CA(E)F [cyclophosphamide, Adriamycin (epi-Adriamycin), 5FU] was given pre- and postoperation. For estrogen receptor (ER) positive patients or those in whom ER status was unknown, hormonal treatment including tamoxifen, toremifen, and LH-RH analogue was given. The resection line was designed at least 3 cm away from the margin of the recurrent chest wall lesion. Intraoperative histological diagnosis using frozen sections was made in most of the cases. A survival curve was drawn by the Kaplan-Meier method.

RESULTS

Operation

Thirteen cases underwent combined resection of the sternum (Table II). The size of the defect ranged from 30 cm^2 to 200 cm^2. Reconstruction was done by plastic surgeons: in seven cases, transverse rectus abdominis myocutaneous (TRAM) flap and vertical rectus abdominis myocutaneous (VRAM) flap was used in seven cases, and latissimus dorsi myocutaneous flap was utilized in the remaining one case. The chest wall was reinforced with Marlex mesh in four cases.

Complications

No serious complication except one major infection was observed. One case who experienced pyothorax recovered without a life-threatening event (Table III). No flap necrosis was recognized. Decrease of pulmonary function was observed in most of the cases with large defects of the chest wall, with recovery within two weeks.

Survival and Local Failure (re-relapse)

The survival curve was drawn by the Kaplan-Meier method (Fig. 1). The 3- and 5-year survival rates were 58.9% and 47.1%, respectively. Two patients survived >5 years after the chest wall resection without distant metastasis (Table III). In particular, patients with a long disease-free interval (DFI) tended to survive longer than those with a relatively short DFI. Local failure (re-relapse) was seen in three cases whose surgical margin was microscopically positive; however, one patient (3) responded to radiation treatment (complete response) and has achieved a >5-year survival with good quality of life.

DISCUSSION

One of the main objectives of this surgical approach was to render the patients free of painful, infectious, and

TABLE II. Chest Wall Recurrence in Breast Cancer Patients: Surgery and Perioperative Systemic Treatments

Case no.	Operation			Systemic treatment	
	Resected	Size of defect (cm)	Reconstruction[a]	Preoperative[b]	Postoperative[b]
1	3 ribs	15 × 10	TRAM	CAF	MMC, CPA
2	3 ribs, sternum	16 × 14	VRAM[c]	-	CAF
3	3 ribs, sternum	9 × 8	VRAM[c]	TAM, radiation	TAM
4	4 ribs, sternum	6 × 5	VRAM	-	-
5	2 ribs, sternum	10 × 10	VRAM[c]	-	TAM
6	2 ribs, sternum	6 × 5	VRAM	-	TAM
7	2 ribs, sternum	7 × 7	dTRAM	-	LH-RH analog, TAM
8	3 ribs, sternum	12 × 10	dVRAM[c]	-	LH-RH analog
9	3 ribs, sternum	15 × 15	VRAM	-	LH-RH analog
10	3 ribs, sternum	20 × 10	LD	CAF	LH-RH analog, CAF
11	2 ribs, sternum	14 × 10	dTRAM	CAF	CAF
12	3 ribs, sternum	13 × 10	dTRAM	CAF	CAF
13	3 ribs, sternum	13 × 10	dTRAM	AF	Toremifen
14	4 ribs	10 × 8	TRAM	-	radiation, TAM, 5′DFUR
15	3 ribs, sternum	17 × 12	dTRAM	CEF	CEF

[a]TRAM = transverse rectus abdominis myocutaneous; VRAM = vertical rectus abdominis myocutaneous; dTRAM = double transverse rectus abdominis myocutaneous; dVRAM = double vertical rectus abdominis myocutaneous; LD = latissimus dorsi.
[b]CAF/CEF: cyclophosphamide; MMC: mitomycin C; CPA: Adriamycin/epidriamycin, 5FU; TAM: tamoxifen. [c]Marflex mesh was used.

TABLE III. Full Thickness Resection for Chest Wall Recurrence in Patients With Breast Cancer: Complications and Long-Term Outcomes

Case no.	Complications		Survival /month	Local failure
	Infection	Flap necrosis		
1	-	-	dead 5	−
2	-	-	dead 39	+
3	-	-	alive 85	+[a]
4	-	-	alive 76	−
5	-	-	dead 13	+
6	-	-	dead 31	−
7	-	-	alive 34	−
8	major	-	alive 31	−
9	-	-	alive 28	−
10	-	-	alive 24	−
11	minor	-	dead 16	−
12	-	-	alive 28	−
13	-	-	alive 3	−
14	-	-	alive 53	−
15	-	-	alive 14	−

[a]For the local failure, radiation therapy was given with complete response.

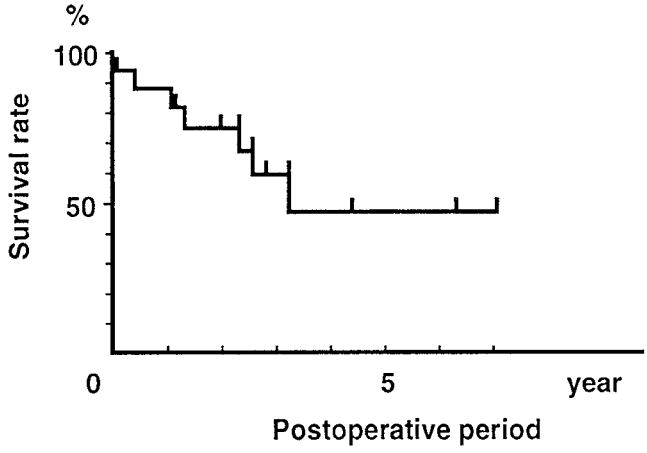

Fig. 1. Survival curve after the chest wall resection (Kaplan-Meier method); 5-year survival rate was 47.1%.

bleeding complications caused by chest wall recurrence. In fact, the condition of most of the patients were judged to be satisfactory by the disappearance of macroscopic tumor and relief from psychological stress. We encountered no serious complications except one case of pyothorax. There was no flap necrosis. Although a minor pulmonary dysfunction developed in several cases, the patients recovered within a few weeks without any special treatment. In the earlier cases, we used Marlex mesh for chest wall reinforcement, but recently, we have been using no artificial reinforcement and have encountered no difficulties of pulmonary function and quality of life. Generally, patients could be discharged 3–4 weeks after the operation.

The 5-year survival rate after chest wall resection in this study was 47%. Shah and Urban [3] reported a 43% 5-year survival rate in 1975 after chest wall resection for patients with solitary local recurrences without distant metastasis. Later, Zoetmulder [5] reported a 50% 5-year survival rate for the patients with similar relapses. In addition, Miyauchi et al.[9] and Ohuchi et al.[11] have also achieved a 48% and 57% 5-year survival rate after chest wall resection in a similar setting. The common finding in reports on the surgical management for chest wall recurrence is that the patients with a long DFI can survive longer than those with a relatively short DFI

[4–11]. Miyauchi et al. [11] clearly indicated a significant difference in the survival rate after the chest wall resection between patients with >2-year DFI and those with <2-year DFI. Also, in our analysis, DFIs of cases who achieved >5-year survival were 150 months and 178 months. Therefore, a DFI of at least >2 years, seems to be an importance indication for surgical treatment in patients with solitary local recurrence.

In addition, in this study we have ambitiously included cases with parasternal lymph node involvement for this surgical approach. In general, parasternal lymph node metastasis is thought to be evidence of systemic disease. In fact, primary tumors with histological parasternal lymph node metastases show poor prognosis. However, we occasionally encounter parasternal lymph node recurrence with formation of a macroscopic mass and a slow growth rate. We have therefore performed en bloc resection of parasternal lymph nodes with hemisternum and the surrounding ribs for selected patients with >2 years DFI, except one case with a 19-month DFI. Six cases were treated by en bloc resection, and a favorable prognosis was achieved at the present time.

Systemic treatments in addition to careful surgical techniques seem to contribute to prolonged survival, although there are no data assessing the efficacy of systemic treatment for such patients. The patients who received long-term endocrine therapy, including LH-RH analog and/or tamoxifen, are likely to survive longer.

In conclusion, the surgical approach using full thickness chest wall resection followed by systemic treatment for solitary local and possibly for solitary parasternal lymph node recurrence seems to be a therapeutic choice for selected patients with a long DFI.

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